

CLAIMS

We claim:

- 5 1. A micromachined device comprising:
a first proof mass and a second proof mass, the first and second proof masses each having a plurality of support arms flexibly coupling the masses to a substrate; and
at least one spring element having a first end and a second end, the first end of the at least one spring element connected to the first proof mass and the second end of the at least one spring element connected to the second proof mass.
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- 15 2. The micromachined device of claim 1, wherein the first end of the at least one spring element is connected to a side of the first proof mass that is closest to the second proof mass and the second end of the at least one spring element is connected to a side of the second proof mass that is closest to the first proof mass.
- 20 3. The micromachined device of claim 2, wherein the first end of the at least one spring element is connected to the first proof at substantially the midpoint of the side of the first proof mass and the second end of the at least one spring element is connected to the second proof mass at a point at substantially the midpoint of the side of the second proof mass.
- 25 4. The micromachined device of claim 1, wherein the first end of the at least one spring element and the second end of the at least one spring element form a straight line that comprises an axis of oscillation of the first proof mass and the second proof mass.
- 30 5. A micromachined device comprising:
a first proof mass and a second proof mass, the first and second proof masses each having a plurality of support arms flexibly coupling the masses to a substrate; and
a plurality of spring elements, each spring element having a first end and a second end, the first end of each spring element connected to the first proof mass and the second end of each spring element connected to the second proof mass.

6. The micromachined device of claim 5, wherein the first end of each spring element is connected to a side of the first proof mass that is closest to the second proof mass and the second end of the at least one spring element is connected to a side of the second proof mass that is closest to the first proof mass.

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7. The micromachined device of claim 6, wherein the first end of each spring element and the second end of each spring element form a straight line that is parallel to a desired direction of oscillation of the first proof mass and the second proof mass.

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8. A micromachined device comprising:

a first proof mass;

a second proof mass;

a plurality of support arms attached to the first proof mass and the second proof mass;

each of the support arms flexibly coupling the first proof mass and the second proof mass to a substrate;

at least one of the support arms including a first end coupled to the substrate and a second end coupled to the substrate;

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wherein at least one of the first and the second proof masses are connected to the at least one support arm at a point between the first end and the second end of the support arm; and

at least one spring element having a first end and a second end, the first end of the at least one spring element connected to the first proof mass and the second end of the at least one spring element connected to the second proof mass.

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9. The micromachined device of claim 8, wherein the first end of the at least one spring element is connected to a side of the first proof mass that is closest to the second proof mass and the second end of the at least one spring element is connected to a side of the second proof mass that is closest to the first proof mass.

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10. The micromachined device of claim 8, wherein the first end of the at least one spring element is connected a side of the first proof mass that is closest to the second proof mass at substantially the midpoint of the side of the first proof mass and

the second end of the at least one spring element is connected to a side of the second proof mass that is closest to the first proof mass at substantially the midpoint of the side of the second proof mass.

5 11. The micromachined device of claim 10, wherein the first end of the at least one spring element and the second end of the at least one spring element form a straight line that comprises an axis of oscillation of the first proof mass and the second proof mass.

10 12. A micromachined device comprising:
a first proof mass;
a second proof mass;
a plurality of support arms attached to the first proof mass and the second proof mass;

15 each of the support arms flexibly coupling the first proof mass and the second proof mass to a substrate;
at least one of the support arms including a first end coupled to the substrate and a second end coupled to the substrate;

20 wherein at least one of the first and the second proof masses are connected to the at least one support arm at a point between the first end and the second end of the support arm; and

25 a plurality of spring elements, each spring element having a first end and a second end, the first end of each spring element connected to the first proof mass and the second end of each spring element connected to the second proof mass.

30 13. The micromachined device of claim 12, wherein the first end of each spring element is connected to a side of the first proof mass that is closest to the second proof mass and the second end of the at least one spring element is connected to a side of the second proof mass that is closest to the first proof mass.

30 14. The micromachined device of claim 13 wherein the first end of each spring element and the second end of each spring element form a straight line that comprises an axis of oscillation that is parallel to a desired direction of oscillation of the first proof mass and the second proof mass.